REMARKS

Claims 1 and 3-10 are pending in the present application. Applicants respectfully request reconsideration of this application in view of the amendments and remarks herein.

Claims 1 and 8 have each been amended to limit the suitable zeolites to those having a ratio of Si:Al of greater than or equal to about 15. Basis is in the specification at page 12, lines 9-13. Claim 1 was also amended to recite that the sulfur trioxide is sorbed onto the sorbent at a site equipped to handle bulk sulfur trioxide, transported to a site requiring delivery of sulfur trioxide and desorbed there, and transported back to the original site to recycle. Basis is in the specification at page 8, line 25 to page 9, line 11.

I. Rejection under 35 USC 103

In the final rejection, the Examiner stated that he presumed that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent evidence to the contrary, and advised Applicants of their obligation to point out claims that were not commonly owned. The Examiner's presumption is correct that the subject matter of all claims herein was commonly owned at the time the inventions were made.

Claims 1 and 3-10 were rejected under 35 USC 103 as unpatentable over US Patent 5,223,237 of Simpson et al. in view of the reference titled 'Study of Absorption of Sulfur Trioxide by Zeolites" by Anurov et al. Applicants respectfully traverse this rejection.

The Simpson et al. patent was cited as teaching an obvious variation of the claimed process and Anurov et al. was cited as disclosing sorption and desorption of a mordenite having a silicon to aluminum ratio of 9.2:1. Thus Applicants' invention was considered obvious.

Applicants' invention is directed to reversible sorption of sulfur trioxide while maintaining high activity of the sorbent. To obtain this continued high activity requires avoiding structural degradation of the

sorbent. Structural degradation of the sorbent results in a loss of sorption capacity for sulfur trioxide. Applicants' invention is also directed to providing sulfur trioxide on a sorbent in a stable, transportable form. Therefore when there is a need for use of small volumes of sulfur trioxide, small containers of SO_3-loaded sorbent can be obtained from a site equipped to handle the hazards presented by bulk storage of sulfur trioxide, the sulfur trioxide desorbed from the SO_3-loaded sorbent, and the used sorbent sent back for recycle. One requiring small volumes of sulfur trioxide does not have to invest in and manage the hazards of its bulk generation and storage.

The cited references, singly or combined, do not teach or suggest this concept. The only teaching by Simpson et al. relating to preventing reduction in bed sorption capacity is to minimize the sulfur oxide residence time on the sorbent (Column 9, lines 56-61). In contrast Applicants' invention permits an extended residence time while maintaining the structural integrity of the sorbent, and thus maintains its high reactivity in repeated cycles. This permits the sulfur trioxide to be sorbed onto the sorbent at one location, transport of the SO_3-loaded sorbent in a container to a second location, followed by desorption of the sulfur trioxide from the SO_3-loaded sorbent at the second location, and return of the used sorbent for recycle. The required short residence time of sulfur oxides on the sorbent as taught by Simpson et al. is directly contrary to the purpose of Applicants' invention. See page 8, lines 22-24 and page 9, lines 4-11 of the specification. Further Simpson et al. teach recycle within the same system as illustrated by Figure 1. There is no suggestion of transport of the sorbent to a different site for desorption. At column 7, lines 23 etc. Simpson et al. teach an embodiment that is quasi-continuous. Thus Applicants maintain that the claimed invention is not obvious over Simpson et al.

Combining Anurov with Simpson et al. does not teach or suggest Applicants' claimed invention. In Figure 3 Anurov et al. depict a graph that shows that the adsorbent activity decreases with the number of cycles. This is attributed to the formation of aluminum sulfate which dealuminizes

the zeolites, and leads to destruction of their crystal lattice and the resultant decrease in adsorptive capacity. At page 3, third full paragraph Anurov teaches that complete poisoning of the zeolite occurs after 5 cycles on average. In comparison, Applicants' Figure 1 shows no deterioration of the sorbent molecular structure over ten cycles when the process of the claimed invention is employed. Anurov et al. does not teach or suggest a process to preserve such sorbent activity. Thus, Applicants maintain that Simpson et al. and Anurov et al. do not teach or suggest the claimed invention.

Neither cited reference teaches or suggests use of silica as a sorbent as claimed by Applicant. Neither teaches or suggests a zeolite having stability which retains capacity over storage. Anurov was cited as teaching a zeolite having a ratio of silicon to aluminum of 9.2:1. Based upon conversion to moles of the weight percentages of SiO_2 and Al_2O_3 given in Anurov's Table I, this number is in error, but regardless, Applicants have amended their claims to require a zeolite having a silicon to aluminum ratio of greater than or equal to about 15. This higher ratio reflects zeolites that are more stable than those with lower ratios. The lower amount of aluminum present compared to silicon means there is less aluminum present to react to form aluminum sulfate to lower the capacity of the sorbent. Further zeolites having the higher ratio of 15 or greater are more hydrophobic. Those having lower ratios as taught by the cited art are more hydrophilic. The higher ratio zeolites used in Applicants' claimed process provide a sorbent that preferentially absorbs sulfur trioxide over water. This is in direct contrast to the zeolites of Simpson et al, which are stated to preferentially absorb water. All of the zeolites specifically named by Simpson et al. have silicon to aluminum ratios of about 5 or less. Thus Applicants' invention provides sorbents which have high silicon to aluminum ratios, are storage stable over time thereby retaining capacity, and can be transported. These unexpected results are not suggested by the cited art. Applicants therefore maintain that Claims 1 and 3-10 are not obvious under 35 USC 103 over Simpson et al. or Anurov et al. singly or combined.

II. Conclusions

In view of the amendments and remarks herein, Applicants respectfully maintain that Claims 1 and 3-10 are patentable over the cited art, and respectfully request that a patent be issued on these claims. Should any questions arise, the Examiner is invited to contact Applicant's attorney at the number noted below.

Respectfully submitted,

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